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BEING CRITICAL OF TECHNOLOGY: AN ANT PERSPECTIVE

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Abstract

This paper argues that the development of a critical approach to technology from an ANT perspective is both possible and necessary. This approach to critique is not based on the belief in the autonomous and rational human agent since it fully acknowledges human/technological entanglement. It is argued that such an approach could make a contribution to the field of critical research of information systems (CRIS). It is also argued that an emphasis on critique is needed within the corpus of ANT studies which are often accused of managerialism. It is further argued that a form of critique is possible within ANT in spite of various sceptical views. In the light of the processes of translation in the formation of network, a conception of critique is developed on the basis of Latour's view of "irreduction" of entities. The central critical question deals with the ways in which entities are betrayed within the process of translation.

Keywords: Critique of technology, ANT, irreduction, translation

1. INTRODUCTION

Although critical research has slowly gained momentum in information systems research (ISR) in the past 20 years, its underlying humanistic beliefs led to an unattentiveness to the operations and effects of technology (Orlikowski & Scott, 2008). As a consequence critical research in IS is not any different from critical research in organisations and management. The increasing and pervasive role of technology in organisatons necessitates, however, a rethink of critique. A typical comment about the inability to conceptualise technology in organisations is made by Berg (1998, p. 466) in relation to ISR informed by structuration theory. He states, with reference to Button (1993), that the problem with a structurational view of technology is that its exclusive allocation of agency to humans causes the technology to 'vanish' from the accounts while it "figures as a *mere* occasion" for social structuring "without any activity or specificity of its own". If the significant role of technology in IS is taken seriously, it also necessitates a reconceptualisation of critique. This reconceptualisation is not only of value to ISR, but also to a critical understanding of all forms of human/technology entanglements.

This paper wants to define a kind of critique that goes beyond the traditional "humanistic" forms. Critique is humanistic when it takes the human agent as the centre and when it makes a sharp distinction between humans and technology. In these conceptions the terrains of the human and the technology are clearly separated and each one is defined *sui generis*. This separation makes it possible for humans to gain critical distance from the technological artefact and to overcome problematical elements of their involvement without technological mediation. The critique is made possible through recourse to meta-theoretical perspectives of an epistemic or deontological nature. Most of the critical approaches in ISR has such a humanist bias whether they draw on Habermas (Hirschheim *et al.*, 1996), or on critical ethnography (Klein & Myers, 1999) or on structuration theory of Giddens (Orlikowski & Baroudi, 1991).

These two elements (centrality of the human agent and a human/technology dualism) of humanistic forms of critique need to be challenged. The centred human is challenged in postmodernism (Doolin, 1998) which renders critique in the form of multiple narratives through which the whole is unmasked as fragmented and contingent. While postmodern theories show that a centred critical researcher is not feasible, they remain in the discursive realm. The idea that everything is discourse and that technology is (only) text, makes it impossible to deal with the materiality of technology. Although the human is being decentred, the basic dualism between humans and technology remains in place here.

This dualism is being challenged by sociomaterial theories which have been developed to understand the human/technology entanglement (Haraway, 1991; Orlikowski & Scott, 2008). These views lead to the realisation that the human and the technological could not be clearly separated and demarcated and that all entities are hybrids. It is not possible to identify human nature in isolation from various kinds of technological mediations. If the decentred human and the human/technology entanglement are fully acknowledged, the question arises about the possibility and nature of the critique. Whereas humanistic forms of critique are based on a view of the autonomous human, the nature and possibility of critique itself could be questioned in sociomaterial views. Humans cannot disentangle themselves any more from various kinds of technological devices in order to gain a distant critical perspective. The question is then how could technology be a focus of critique if it cannot be clearly distinguished from the human? How is critique possible in a situation where humans are not the only actants? How is critique of technology possible if we cannot separate ourselves from technological effects?

In order to develop a different approach to critique, we need to become more specific about technological effects. Conceptions of critique are closely related to conceptions of technology. Various attempts (such as DeSanctis & Poole, 1994; Rose & Treux, 2000) have been made to be more specific about the technological artefact after the call by Monteiro & Hanseth (1996, p. 378). This call for specificity should not be seen as a quest for more precise definitions of the essential nature of technology, but for ways to gain more clarity about the functioning and effects of technology in any

collective. The task is to find the tools that would allow us to establish in a more detailed way the effects of technology in a collective.

This paper investigates the possibility and nature of critique from an actor-network theory (ANT) perspective. It is argued that a view in which the actancy of technology in heterogeneous collectives is recognised, makes an approach to critique possible that goes deeper than the "humanistic" forms because it would make visible the multiple ways in which technology penetrates into all spheres.

The paper provides first a selective account of ANT to highlight its conceptions of technology and to articulate an understanding of critique. It then uses and expands on an existing ANT informed study to illustrate what an ANT approach to critique might look like in practice. It is argued that, once the seamless unity of sociomaterial collectives is acknowledged, critique cannot be based on a notion of the autonomous and rational human since we are always inside the collectives which mediate our very understandings and critiques. We are always, as Haraway (1991) comments, "inside the belly of the beast". It is therefore not possible to disentangle ourselves from these collectives in order to gain an outside perspective. It is argued that ANT makes such a approach to critique possible so that we could become critically aware of our involvement and being implicated in hybrid associatons.

2. ANT

This attempt to develop an ANT approach to critique may come as a surprise for two reasons. Firstly ANT is mainly known for its careful, descriptive ethnographic studies of various kinds of assemblies such as socio-technical systems. Ethnographic research stands in the tradition of interpretative approaches that are as such not critical, since there is no critical intention or critical method (Stahl, 2008). ANT also does not attempt to develop a critical ethnograpy as understood by Klein & Myers (1999). Secondly, the suspicion that ANT is not conducive to critical research is confirmed by the many instances where it is employed in the service of managerialism in organisational studies (Monteiro, 2004, p. 132; Star, 1991). The ANT concepts of actant, enrolment, translation and irreversibility are used in managerial approaches to show how networks could be constructed and maintained in a more coherent way through the alignment of interests. Scepticism has therefore been expressed by Walsham (1997) about the critical possibilities in an approach where a clear distinction is not made between the human and the technical and where the possibility does not exist of a perspective outside the network from where critique could be launched. This is echoed by Saldanha (2003) who provides a summary of the ways in which ANT fails to be critical: It is managerialist, centrist, relativist, not geographical enough, too anti-humanist and too local. After having attempted to develop critique based on ANT, Mitev (2009) found that ANT does not provide adequate tools for a critical analysis of information systems and has to be augmented with a critical theory of power.

It is argued here that ANT does make a form of critique possible that has the potential to cut deeper than other forms of critique and that broadens the scope of critique. It cuts deeper because it is centrally concerned about the ways identities are shifted and subjectivities produced. It is also broader because it incorporates the active contribution of different kinds of entities. In brief, critique in ANT has to be understood in an ontological and moral way. It is interested in the ways worlds are being produced through translations and associations. It is also interested in the multiple ways the identity and interests of any entity are being betrayed in the social processes of assembly. In the rest of this section, the process of translation through which heterogeneous networks are assembled, the role of technology and the meaning of critique will be discussed.

The processes of assembly refer to the ways actor-networks (or collectives) come into being and how they are composed and maintained. The networks are heterogeneous in the sense that any kind of entity could become an actant. The reference to "any kind of entity" refers to ANT's theory of generalised symmetry. This entails that no *a priori* distinction could be made between humans and nonhumans when the processes of assembly are traced. Because of the symmetry, the concept "social" does not only refer to human relations, but to the relations between all kinds of entities. "Social" refers

therefore as much to the relation between humans, as to the relation between circuits on a motherboard, or between the human and the laptop. In its focus to trace the ways in which a macro-actant comes into being and the ways in which power and resources are distributed in a collective, ANT makes explicit how interests are being translated and shifted. Interests are as much translated among humans as among humans and nonhumans. It is therefore important not only to trace the transactions between humans, but also those between nonhumans and those between humans and nonhumans. This expansion of the concept *social* to all kinds of relations makes it possible to trace all the shifts (or translations) that are taking place when entities are being associated. This methodological principle of symmetry does not mean that there are no differences between entities (as claimed i.a. by Mitev 2009, p. 20) because it is precisely ANT's purpose to trace how differences are being produced and roles allocated in an actor-network. The principle of symmetry is essential because it would not be possible to trace this production if stable identities and differences are already inscribed into the nature of things. It would also not be possible to trace the actants freely accross the whole spectrum of all kinds of entities if predefined boundaries are imposed beforehand and if predefined characteristics are ascribed to entities. The allocation, for example, of the attributes "intentional" or "rational" to explain human actions undermines the attempt to explain how these actions are produced in a particular actor-network. No entity should be labelled "human" or "natural" or "technological" (or "system" or "lifeworld") before the assembling has been traced. Since all these attributes and categories are outcomes of processes of assembly, they cannot be used as the basis of explanations, but are in need of explanation themselves. The reason is that the investigation which traces all the translations would already be prejudiced by these prior decisions.

The processes of assembly consists of the association of one entity with another. In order for an entity to become associated with another, it has to undergo a process of translation. Translation is not simply the process in which meanings in one language are converted equivalently into another language. Within the ANT context of assembly where entities are enrolled within the networks of others, translation refers to the ways the purposes, interests and identities of entities are changed in order to become enrolled within a collective. Although *translation* suggests equivalence, it is important to be aware of the various and subtle ways in which changes take place during the translation process. During the process of translation "[t]he identity of actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited" (Callon, 1986, p. 203). Latour (1995) illustrates this with his classical example of the cat, the seagull, the modified door and the catflap. He states that the technological processes would not have been possible if identities were to remain fixed. For an enrolment to be successful, the translation of interests and identities should take place. The concept of translation provides ANT with a methodological tool to trace the way in which a collective comes about. It makes it possible to trace how power is accumulated and how resources are distributed in a collective. Any entity could be an actant as long as it "makes a difference", or has an effect on others. The important insight of ANT is that it provides the conceptual tools to trace the ways in which all kinds of heterogeneous actants participate in the establishment and maintenance of a collective. It is possible for a human to enrol another human in a plan of action, or for humans to be enrolled through the inscription of roles in an information infrastructure.

Technology plays an important role in the assembly processes since it contributes to the change and stabilisation of identities. In the development of an IS, technology does not only play the role of an intermediary which obediently conveys messages as designed, but it mediates the interests of all entities involved. In the process of mediation, purposes, identities and interests change. The significance of the roles technology plays lies in its tremendous power to effect certain shifts, and, once black-boxed, to hide the shifts that took place. The notion of irreversibility (Callon, 1991, p. 159) refers to the stage in the development of a collective where it is very difficult to go back to the place where identities and relations were still fluid. ANT steers a course between the extreme views where technology is seen as a mere social construction or as a substantive entity determining its own application. The effects of technology in a particular context cannot be explained with reference to such inscribed or inherent features, but should be traced to the whole of the actor-network within which technology plays a role. The "affordances" of technology does not determine its use, but is a

"prediction" and "promise" (Latour, 2002, p. 250) of what it might bring into the collective. To state that technology makes everything to "stand reserve" (Heidegger, 1977) already prejudges the outcome of an investigation. Actancy is only possible once various entities are aligned in a network from where power is drawn. Technology is a powerful actant when it becomes an irreversible black box. The process of technologising also entails the reversal of force where the weak becomes powerful through the enrolment of technological entities. Technology therefore plays a significant role in the collective in the ways it contributes to the shift and stabilisation of identities. If technology is seen as an actant it does not simply execute what is inscribed into it, but prescribes behaviour to others in ways that were not anticipated by designers or implementers. These effects of technology can only be established through empirical research by careful (ethnographic) tracing of all entities. Since the critique of technology is centrally interested in these effects it has to trace actants.

ANT does not function with a theory or system of values as an orientation point from where critique could be rendered. It remains true to its ethnographic roots by "following the actors" consistently. Critique is not the suspicion of actors' narratives as proposed in critical ethnography (Bowker & Star, 1994; Klein & Myers, 1999) since the researcher cannot claim to know better than the subjects themselves by going beyond them to uncover their real motives or the underlying causes of their actions. The possibility of critique could only arise once the collective has been traced carefully in order to allow all the entities to show to what extent their interests have been betrayed and their subjectivities produced. While critique is centrally interested in these betrayals, the extent of betrayal cannot be established in a simple and unambiguous way in the absence of essentialistic identities. While the theoretical and value-laden perspective of the researcher cannot define the betrayal, the voice of the subject cannot be taken at face value, either. It cannot simply be said that the oppressed worker or colonial subject provides the definitive critique of the collective, since no subject (or marginalised) position could be privileged. The task of the critical researcher is to juxtapose multiple voices in a pinboard fashion with the expectation that betrayals may become visible to the insiders (Law, 2002). The hope is that the visibility of the ways and extents to which interests of all subjects have been shifted could enable these subjects to devise strategies to resist or change the way in which they were enrolled.

Since there is no meta-narrative in ANT, critique is not spectacular and sweeping, but limited and specific. It is not a sweeping process which aims at a general judgement that could be applied in a particular situation. A critical approach in ANT is centrally interested in how the macro-actant comes into being and how its position is maintained through the translation and enrolment of others. Critique is basically interested in the ways in which identities are created, resources are distributed and the extent to which the processes of tanslation represent forms of betrayal. The ontological basis of critique lies in its interests to show how and to what extent the identity and interests of entities are shifted.

This approach to critique is rooted in Latour's theory of "irreductions" which descibes the ontology of all entities. Latour states that "[n]othing is, by itself, either reducible or irreducible to anything else" (Latour, 1993, p. 158). This ontological principle is related to a moral principle. Any entity could be related (reduced) to any other entity, but no such relation does justice to the entity itself. Although any entity could be related (reduced) to any other entity, no such relation represents the unique identity of the entity. The possibility for any entity to be reduced to any other entity refers to the endless scope for association. From this follows the moral element which cautions against the ways in which one entity is reduced to any other. It echoes Law's (1997) comment that any translation is also simultaneously a betrayal. While avoiding any notion of essentialism, Latour makes a negative statement by claiming that no entity could be reduced to any other. One implication of this is that no entity could be reduced to its relations with others. It does not mean that a core, substantial identity escapes these relations. The essentialism ANT wants to avoid is one where such a substantive identity is postulated and used to explain radical difference. The notion of "irreductions" does not claim a positive identity, but states it rather negatively. Further insight into the process of translation is now possible. Any association (similarity) between any two entities is not the outcome of natural qualities, but is created through

translation. Since each entity is absolutely unique, it could not simply be seen as an instance of anything else (such as a universal law). This uniqueness of an entity cannot be fully described or known since it is not possible to establish the essence of an entity.

Because of the entanglement of the human and technological, critique cannot be understood in isolation from critique of the collective as a whole. No actancy within a collective could be seen in isolation from the others because they draw on each other and interchange power and resources. The kind of actancy exercised by a particular technological artefact is dependent on its relations within the collective. It is therefore not possible to isolate a "critique of technology" from a critical evaluation of the processes of translation in a collective. It is possible, however, to trace empirically the kind of actancy technology exercises in a particular context. Because of the invisible effects of technology it is essential to find ways to identify and trace these hidden effects. Since technology exercises power and has certain effects care must be taken with a view to the kinds of roles they play.

3. CHANGING WORK AND IDENTITIES

The study of Bloomfield & McLean (1996) is being used to illustrate how the role of technology could be critically approached. While this study represents an attempt to provide a critical account of technology, some aspects need to be expanded and emphasised to illustrate the particular critical focus. Bloomfield & McLean (1996) investigate the design and implementation of Care Manager System, an information system in the National Health Service in the UK as part of the implementation of a Care Programme Approach which focuses on psychiatric patients outside institutions. They locate this system against the background of recent trends in psychiatry which emphasise the wholeness, integrity and autonomy of the person. It is motivated by a notion of empowerment and recognition of the rights and sovereignty of the mental health patient (*ibid*., p. 376). A more holistic approach is followed to ensure the care of patients who are not institutionalised any more, but remain in their own communities. The system wants to ensure an equal distribution of services and the identification of all the needs of the patients.

In order to provide these services detailed information is needed about each patient. This information is not only of a clinical nature, but includes social, cultural and practical aspects of patients' lives. Information systems were developed to manage all the information. Central in these information processes is the form which the "keyworkers" had to use to capture the profiles of the patients. The keyworkers who are relatively low-skilled officials, complete the forms during their consultations with the patients. This involvement of the patient is seen as an important element of the system based on a notion of autonomy. Autonomy is portrayed in Enlightenment terms as insight into the self and as a form of self-government. Because patients are seen as autonomous and rational human beings, they are required to participate in the identification of their needs and to take responsibility for the information that is gathered about them. The patient is produced as a particular kind of choosing and rational actant. Through categories contained in the form, patients' details and medical needs are gathered and organised.

In order to analyse this case study critically in the attempt to draw implications for an ANT approach, we focus on the technology of the form. The form is not simply an intermediary which prescribes to others the behaviours that are inscribed into it, but it is an actant which actively contributes to changes that were not anticipated and that are not always desirable. The form defines the identities not only of the patient, but also of the keyworkers and the psychiatrists. The patient's interests are translated into the categories of possible needs the form makes provision for. In this way the intentions of the Care Manager System are mediated through the detour of the form. While the initial aim was to promote a level of standardisation and efficiency through predefined categories, patients' needs are predetermined. The projection of patients as autonomous and participative in the establishment of their needs makes them responsible and accountable for what is captured on the form.

The study is an example of a critical ANT approach to technology because it makes explicit and problematise the effects of the technological mediation on the nature and functioning of a particular system of health care. While the motives of patient integrity, self-management and responsibility are certainly important in a health care system that aims to be emancipatory, the intentions and goals shift once the technological mediator enters the scene. The forms, designed to capture patients' needs effectively, became a powerful and central actant in the psychiatric process. The forms redefine the needs of patients, capture their accountability and enable the relatively low-skilled keyworkers to diagnose and assess patients.

Bloomfield & McLean (1996, p. 386) show that the form plays a role to construct psychiatric practice. In this process the interests of patients, keyworkers, and psychiatrics are translated. The critical question is not so much whether, but to what extent their interests are being shifted and whether it could be seen as a betrayal. If one were to focus on the problematical aspects of the technological effects, one could see how the keyworkers are produced as information managers concerned about the correct completion of the forms, or how the psychiatrists found that their practice has changed to one where they experienced an overload of paperwork. This leads to the comment: "As we spend more time filling in forms there is less time available for patient care" (*ibid*.). Communication with the patient is not so much informed by their professional interests and competence, but it is shaped by the need to complete a form. The form therefore produces the framework for the communication with the patient. The result is that mental health care has been translated into a form of information management (*ibid.,* p. 378). Psychiatric diagnosis is determined by what could be captured and processed by the form. Psychiatrists found themselves dealing more with forms than with patients, a fact which redefines their primary professional focus. It became clear that the strong inscriptions on the form did not translate the patients' needs truthfully when some of them withdrew from the process that intended to empower them.

This critique does not have the intention to disband the technological intervention, or to see technology necessarily as *Ge-stell* (Heidegger, 1977) where everything is treated as a resource, but to show how technology contributes to the drift (Ciborra & Hanseth, 2000) in the collective and to the way work and identity are redefined and how agency and resources are redistributed. It is clear that the introduction of technology does not simply lead towards either increased surveillance or enhanced emancipation. Bloomfield & McLean describe how IT could be a "source of oppression and control". They ask the question whether IT is "enslaving or emancipating" (Bloomfield & McLean, 1996, p. 372). In this process they do not use a narrative of empowerment but focus on how "subjects are *constituted* as empowered" (*ibid*.). Although psychiatric care has moved out of the psychiatric ward into the community, the attention shifted in a holistic way to patients' needs, and patients participate more actively in their own diagnosis, it does not imply empowerment and emancipation in a simple way. The patients are constituted as autonomous, independent and responsible for themselves and for their own diagnosis. Technology became a necessary means to achieve these goals and, typically, constitutes a detour which introduces different goals and unintended effects, some of which seem to be clearly undesirable.

The material inscription of the categories provides stability and irreversibility and once the forms became a *black box* they generate certain outcomes. It is clear that the form exerts a kind of actancy which adds new intentions and goals to those that informed the design. To the initial purpose of processing information effectively was added a new definition of knowledge as what could be processed by a form. In this process the information which is not included in the predefined categories is excluded. The information management of which the form is a key element, reshapes the patients' needs, the role of the keyworkers and the professional practice of the psychiatrists. The forms and lists mediated the assessment and interpretation of patients' needs (*ibid.,* p. 374). As such they also exclude needs that are not part of the classificatory system with the result that it is not possible for the patients to include needs that are not predefined by the form.

From an ANT perspective, the critical approach in this study is still limited because the various actants have not been adequately followed. In order to provide a more comprehensive form of analysis and

critique, it should have included the narratives of the patients who might have elaborated on the effects of the technology which lead to the withdrawal of some. This might have indicated more clearly how and to what extent the form betrayed their interest. This would indicate that the "irreducibility" of the patients is affected in an attempt to reduce their needs to what is contained in the forms. The technology also prescribes to patients a form of rationality and choice with which they may feel uncomfortable. One could also listen more to the testimony of the forms which faithfully captured a wide range of patient needs and stored it patiently until it could be retrieved. The information system could testify to the way it placed psychiatrists in a discretionary position from where decisions about patients could be taken.

In spite of these limitations, this case illustrates how technology contributed to the redefinition of the identities and interests of patients and psychiatrists. It also created the new identity of the relatively unskilled keyworkers who were enabled to perform a relatively high-level function. This shaping of identities and interests are inherent in the technical details of the form. On the basis of the effects of this particular form one could gain some understanding of the relation between design and outcomes. This is not a deterministic relation since technology could have a different effect in another collective. In this particular collective the form actually prescribes the kind of discourse that will take place between the patients, keyworker and the psychiatrist.

ANT avoids a technological determinism where identities and behaviour are necessary effects the technological design. ANT also avoids social constructivism where the effects of technology are determined by social meanings. It acknowledges on the one hand the materiality of technology associated with the presence of irresistable force, and the sociality of technology associated with its flexibility. Although technology is designed with particular purposes in mind, it may have effects in a particular collective that stand in a loose relation to the intentions of the design. An investigation of the intentions and design of the technology provides an inadequate view of its effects. While the particular effects of technology should be traced as an outcome of a particular collective, the power and intensity of these effects have to do with the materiality of the technology.

4. CONCLUSION

This analysis of the study of Bloomfield & McLean provides a limited account of the way in which ANT might make critique possible by focusing on the way the identity and interests of entities in a network (such as the patient, the key worker or the psyciatrist in this case) are shifted in ways they may experience as problematical. In this process these entities are reduced to conform to an identity prescribed by the technology of the form. In this process their "irreducibility" has been violated.

It has been argued that technology is not only designed to inscribe, but that it also prescribes the identities, interests and behaviour of entities. Technology does not only prescribe what is inscribed into it since it acts to effect changes that were not anticipated. One should not regard technology as the monster with an own substantial (good or evil) identity that only has certain kinds of effects. Exactly what effects it has depends on the particular actor-network of which it is part and from which it draws its strength. The particular ways in which technologies became part of a collective determines the kinds of effect it has. This effect could be subtle and powerful and is often undetected and underestimated. Since the exponentially increasing rate of the effects of technology could be expected to continue, critical investigation of technology is necessary. This critique cannot be based on the assumptions that humans are autonomous beings that could control or limit technology. Neither can it be based on the assumption that technology is a substantive entity on its own which always exerts a certain kind of effect, regardless of the particular context within which it functions. A more fine-grained approach calls for a close investigation of the particular effects of technology within a particular context to establish in what ways and to what extent the identity of entities have been betrayed. It has been argued that ANT provides the means to analyse and critique the role of technology in a collective and that such an investigation is essential in the light of the ways in which existence is shaped through the proliferation of technological actants. It has been shown that a critique

of technology is not only possible in ANT, but also a necessity to avoid the accusations of managerialism with its apparent preoccupation with the micro-level of analysis.

This article has shown how a kind of critique of technology is possible which takes the unavoidable sociomaterial nature of a collective into account. This is done in such a way that the technological could still become a focus of attention as long as the the concept of the social is adequately expanded. The critique focuses on the active role of technology which cannot be attributed to an essential nature, or to the way it is a mere product of human design. To recognise the active role of technology is to see how it effects changes that could not be attributed to a form of technological determinism or to the inscribed design. Once these two possible explanations of technological effects are avoided, it becomes possible for the critical researcher to attend closely to the kinds of effects technology has in a particular context. While most of the work in ANT deals with these kinds of effects, a critical angle asks the normative question as well. This normative question cannot be asked from a centricist or a meta-position but has to be asked from the inside. The key element in this normative questioning is the extent to which entities are betrayed in the associative processes of translation. The critical researcher has an important role to play in enabling insiders to articulate these betrayals and in making it visible to others. Transformation does not flow automatically from critique, but is dependent on the kinds of actions insiders will take in response to the betrayals. The discussion of the case study has shown that power could be assembled locally in an artefact.The multiple narratives about this concentration of power could reveal the implications for the various entities of these powerful effects. It could reveal how the effects of power are inscribed in the identity and agency of the entities and how these entities participate further in the generation of the power.

An insight into the nature of critique should enable insiders to become more critically involved in the processes of translation. Critique needs not only be rendered afterwards, but it could accompany the very processes of assembly. Once participants realise that any technological intervention is inevitably a mediation of identities and interests, they could be alerted to the subtle shifts that is implied in their own involvement.

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